and two near Lake Superior. Only six of the highs reached the Atlantic, one was last noted in the central part of the Gulf of Mexico, and the rest lost their identity or were merged in other highs in the interior. The general tendency of the highs was toward a translation along the northern border of the country. The more marked characteristics of the highs were the greater number and better definition than in the past six months.

The lows were affected by the permanent high just mentioned, as none had their beginning in the Pacific. Five were first noted to the north of Montana, one in Oregon, and two in Arizona. The translation of the lows was mostly along the northern border. Five of the lows reached the north Atlantic Coast, one disappeared north of Lake Superior, and the other two in the St. Lawrence Valley.

The highest wind of the month, 68 miles per hour on the 18th, at Chicago, was in connection with storm V, when it was central in north Michigan. This storm was rather remarkable in that it had a well-developed oval and very steep barometric gradients, but no rain fell till it reached the lower Lakes and then only in slight sprinkles. It was of a class of storms previously described which are quite prevalent in April and May in the Northwest, but without precipitation. The lowest pressure, but one, of the month, 29.18 inches, at Prince Albert p. m. of 21st, occurred in the center of low area VI, and this storm also had little or no precipitation in the Northwest. As low area No. VIII passed over Qu'Appelle the lowest pressure of the month, 29.12 inches, was noted there, p. m. of the 26th. The storm also had very steep gradients and a well formed oval but without precipitation till it reached the upper Mississippi Valley where there were only sprinkles.

Movements of centers of areas of high and low pressure.

Number.	First observed.			Last observed.			Path.		Average velocities.	
	Date.	Lat. N.	Long. W.	Date.	Lat. N.	Long W.	Length.	Duration.	Daily.	Hourly.
High areas.		°	°		°	°	*Miles.*	*Days.*	*Miles.*	*Miles.*
I	1, a. m.	50	85	4, p. m.	40	70	1,060	3.5	303	12.6
II	5, a. m.	52	112	8, a. m.	48	62	2,270	3.0	756	31.6
III	5, p. m.	37	124	11, p. m.	29	81	3,770	6.0	628	26.2
IV	9, a. m.	50	90	13, p. m.	46	59	2,180	4.5	485	20.2
V	9, p. m.	42	127	15, a. m.	36	91	2,960	5.5	539	22.5
VI	13, p. m.	49	129	19, a. m.	32	80	3,800	5.5	691	28.8
VII	18, a. m.	52	109	22, p. m.	41	68	2,630	4.5	584	24.3
VIII	20, a. m.	40	127	27, a. m.	29	88	3,670	7.0	525	21.9
IX	26, a. m.	48	99	28, a. m.	39	80	1,140	2.0	570	23.8
X	26, p. m.	48	128	30, a. m.	51	88	2,010	3.5	574	23.9
XI	28, a. m.	41	129	30, p. m.	39	99	1,720	2.5	686	28.6
Total							27,210	47.5	6,343	
Mean of 11 paths							2,474	4.3	577	24.0
Mean of 45.5 days									573	23.9
Low areas.										
I	1, p. m.	33	111	7, a. m.	48	56	3,220	5.5	587	24.4
II	5, p. m.	33	114	10, p. m.	45	61	3,650	5.0	730	30.4
III	9, p. m.	53	117	14, a. m.	48	76	2,370	4.5	630	26.6
IV	12, p. m.	54	112	18, a. m.	48	62	2,700	5.5	491	20.5
V	15, p. m.	54	109	20, a. m.	46	58	2,650	4.5	588	24.5
VI	18, p. m.	43	120	23, a. m.	49	89	2,080	4.5	462	18.8
VII	23, p. m.	54	105	28, a. m.	41	69	2,660	4.5	591	24.6
VIII	25, p. m.	51	112	*	44	77	3,450	8.5	406	16.9
Total							23,240	42.5	4,484	
Mean of 8 paths							2,905	5.3	560	23.3
Mean of 42.5 days									547	22.8

*May 4, a. m.

TEMPERATURE OF THE AIR.

[In degrees Fahrenheit.]

Both the mean temperatures and the departures from the normal are given in Table I for the regular stations of the Weather Bureau, which also gives the height of the thermometers above the ground at each station. The mean temperature is given for each station in Table II, for voluntary observers.

The *monthly mean temperatures* published in Table I, for the regular stations of the Weather Bureau, are the simple means of all the daily maxima and minima; for voluntary stations a variety of methods of computation is necessarily allowed, as shown by the notes appended to Table II.

The *regular diurnal period* in temperature is shown by the hourly means given in Table V for 29 stations selected out of 82 that maintain continuous thermograph records.

The *distribution of the observed monthly mean* temperature of the air over the United States and Canada is shown by the dotted isotherms on Chart IV; the lines are drawn over the Rocky Mountain Plateau region, although the temperatures have not been reduced to sea level, and the isotherms, therefore, relate to the average surface of the country occupied by our observers; such isotherms are controlled largely by the local topography, and should be drawn and studied in connection with a contour map.

The *highest mean temperatures* were: In the United States, Key West, 75.5; Yuma, 72.4; Jupiter, 71.5; Corpus Christi, 70.4; Tampa, 70.3. In Canada, Bermuda, 65.0; Esquimault, 46.3; Halifax, 40.3; Toronto, 42.0; Port Stanley, 41.4; Kingston and Ottawa, 40.8; Montreal, 41.1. The lowest were: In the United States, Sault Ste. Marie, 36.9; Eastport, 38.6; Marquette, 37.8; Duluth, 40.0. In Canada, Father Point, 32.8; White River, 30.1; Quebec, 35.9; Port Arthur, 35.0.

As compared with the normal for April the mean temperature for the current month was in excess slightly on the Pacific and Atlantic coasts and appreciably over the Lake Region, New England, and Nova Scotia. It was slightly deficient throughout the Mississippi watershed and its tributaries and in the Canadian Northwest Provinces.

The greatest excesses were: In the United States, Moorhead, 4.4; Boston, 3.9; Sacramento, 3.1; Baker City, 3.0; Red Bluff, 2.7; Northfield, 2.6. In Canada, Yarmouth, 4.2; Halifax, 2.9; Rockliffe, 2.8; Port Stanley, 2.2. The largest deficits were: Cheyenne, 3.1; Springfield, Ill., 2.5; Springfield, Mo., 2.2. In Canada, Swift Current, 1.1; Qu'Appelle, 0.7; Medicine Hat, 0.4.

Considered by districts the mean temperatures of the current month show departures from the normal as given in Table I. The greatest positive departures were: New England, 1.6; North Dakota and Middle Pacific, 1.8; northern Plateau, 1.5. The greatest negative departures were: Florida Peninsula and southern Slope, 1.2; east Gulf, 1.6.

In Canada.—Prof. R. F. Stupart says:

> Over the greater part of the Dominion the mean temperature was higher than the average by between 1° and 4°, but in Algoma, Nipissing, and parts of eastern Quebec it was lower than the average by from 1° to 3°. In Alberta, Saskatchewan, and Manitoba the excess was between 3° and 4°.

The years of highest and lowest mean temperatures for April are shown in Table I of the REVIEW for April, 1894. The mean temperature for the current month was the highest on record at: Sacramento, 62.6, and Boston, 49.0. It was the lowest on record at: Amarillo, 55.3.

The *maximum and minimum temperatures* of the current month are given in Table I. The highest maxima were: 100, Yuma (17th); 96, Phœnix (18th); 94, San Luis Obispo (10th), Fresno (16th); 93, Abilene (7th), Red Bluff (25th); 92, San Antonio (7th); 90, Los Angeles (10th), Roseburg (15th), Williston (26th), Moorhead (27th). The lowest maxima were: 59, Eastport (29th); 61, Nantucket (30th); 62, Block Island (30th); 65, Woods Hole (30th); 66, Sault Ste. Marie (22d), Port Angeles (25th); 68, Narragansett Pier (30), Tatoosh Island (15th). The highest minima were: 66, Key West (17th); 59, Jupiter (11th); 53, Port Eads (10th); 52, Corpus Christi (9th); 50, Galveston (9th), New Orleans

(10th). The lowest minima were: 5, Sault Ste. Marie (19th); 9, Marquette (19th); 10, Alpena (19th); 12, Northfield (20th); 14, Duluth (19th); 15, Eastport (20th); 16, Moorhead (19th).

The *limits of minimum temperatures*, 32° and 40°, are shown by lines on Chart No. V.

The *years of highest maximum and lowest minimum temperatures* for April are given in the last four columns of Table I of the REVIEW for 1896. During the current month the maximum temperatures were equal to or above the highest on record at: Red Bluff, 93; Roseburg, 90; Portland, Oreg., 89; Northfield, 82; Fort Canby, 80; Astoria and Point Reyes Light, 78; Lander, 76; Tatoosh Island, 68. The minimum temperatures were not the lowest on record at any regular station of the Weather Bureau.

The *greatest daily range of temperature and the data for computing the extreme and mean monthly ranges* are given for each of the regular Weather Bureau stations in Table I. The largest values of the greatest daily ranges were: Marquette, 53; Williston, 51; San Luis Obispo, 50; Northfield, Winnemucca, and Carson City, 45; Lander, 44.

Among the *extreme monthly ranges* the largest were: Moorhead, 74; Williston and Northfield, 70; Huron, 66; Marquette, 65; Duluth and Pueblo, 64. The smallest values were: Key West, 18; Jupiter, 24; Port Eads, 26; Tatoosh Island, 30; Galveston and Corpus Christi, 31.

Accumulated monthly departures from normal temperatures from January 1 to the end of the current month are given in the second column of the following table, and the average departures are given in the third column for comparison with the departures of current conditions of vegetation from the normal condition.

Districts.	Accumulated departures.		Districts.	Accumulated departures.	
	Total.	Average.		Total.	Average.
	°	°		°	°
New England	+ 5.2	+ 1.3	North Dakota	— 7.0	— 1.8
Middle Atlantic	+ 2.9	+ 0.7	Northern Slope	— 4.6	— 1.2
South Atlantic	+ 1.0	+ 0.2	Southern Plateau	— 5.1	— 1.3
Florida Peninsula	+ 2.5	+ 0.6	Middle Plateau	— 9.3	— 2.4
East Gulf	+ 0.6	+ 0.1	North Pacific	— 1.4	— 0.4
West Gulf	+ 5.2	+ 1.3	Middle Pacific	— 4.0	— 1.0
Ohio Valley and Tenn.	+ 2.4	+ 0.6	South Pacific	— 2.9	— 0.4
Lower Lake	+ 5.2	+ 1.3			
Upper Lake	+ 8.8	+ 2.2			
Upper Mississippi Valley	+ 2.6	+ 0.6			
Missouri Valley	+ 0.5	+ 0.1			
Middle Slope	+ 1.5	+ 0.4			
Northern Plateau	+ 4.5	+ 1.1			
Southern Slope	+ 0.0	+ 0.0			

PRECIPITATION.

[In inches and hundredths.]

The *distribution of precipitation* for the current month, as determined by reports from about 2,500 stations, is exhibited on Chart III. The numerical details are given in Tables I, II, and III. The total precipitation for the current month exceeded 6 inches in the greater portion of southern Louisiana, southeastern Missouri, central Iowa, southern Illinois, Indiana, Tennessee, and Kentucky, as also in southern Nova Scotia.

The larger values for regular stations were: Port Eads, 11.70; Jupiter, 8.47; Tatoosh Island, 7.61; Cairo, 6.49.

Little or no rain fell in southern California, Nevada, Arizona, New Mexico, and western Texas.

Details as to *excessive precipitation* are given in Tables XI and XII.

The *years of greatest and least precipitation* for April are given in the REVIEW for April, 1890. The precipitation for the current month was the greatest on record at: Port Eads, 11.70; Jupiter, 8.47; Des Moines, 7.37; Vineyard Haven, 5.95; Oklahoma, 5.87; Alpena, 4.59; Concordia, 4.20. It was the least on record at: Los Angeles and San Diego, 0.02; Carson City, 0.03; Point Reyes Light and Port Angeles, 0.48; Cleveland, 1.34.

The *diurnal variation*, as shown by tables of hourly means of the total precipitation, deduced from the self-registering gauges kept at the regular stations of the Weather Bureau, is not now tabulated.

The *average departure* for each district is given in Table I. By dividing each current precipitation by its respective normal the following corresponding percentages are obtained (precipitation is in excess when the percentage of the normal exceeds 100):

Above the normal: New England, 121; Florida Peninsula, 315; east Gulf, 130; Ohio Valley and Tennessee, 112; upper Lake, 126; upper Mississippi Valley, 127; Missouri Valley, 137; middle Slope, 148.

Normal: Southern Plateau, 100.

Below the normal: Middle Atlantic, 77; south Atlantic, 91; west Gulf, 60; lower Lake, 87; North Dakota, 59; northern Slope, 75; southern Slope, 50; middle Plateau, 56; northern Plateau, 76; north Pacific, 61; middle Pacific, 39; south Pacific, 11.

The *current departures* from the normal precipitation are given in Table I, which shows that precipitation was in excess in the east Gulf States, the Tennessee and Ohio valleys, the Mississippi and lower Missouri valleys, the central Lakes, the St. Lawrence Valley, New England, and Nova Scotia. It was deficient in the west Gulf States, the Rocky Mountain Plateau and Pacific Coast regions. The large excesses were: Port Eads, 8.7; Jupiter, 6.0; Des Moines, 4.6. In Canada, Yarmouth, 4.2; Halifax, 2.9; Rockliffe, 2.8; Port Stanley, 2.2. The large deficits were: Kittyhawk and Astoria, 3.1; Cape Henry, 3.0; Norfolk and Fort Canby, 2.6. In Canada, Swift Current, 1.1.

The *total accumulated monthly departures* from January 1 to the end of the current month are given in the second column of the following table: The third column gives the percentage of the current accumulated precipitation relative to its normal value.

Districts.	Accumulated departures.	Accumulated precipitation.	Districts.	Accumulated departures.	Accumulated precipitation.
	Inches.	*Per ct.*		*Inches.*	*Per ct.*
Florida Peninsula	+ 4.40	141	New England	— 1.70	86
East Gulf	+ 1.00	105	Middle Atlantic	— 2.80	89
Ohio Valley and Tenn.	+ 2.80	117	West Gulf	— 0.90	94
Upper Lake	+ 0.50	105	Lower Lake	— 0.80	93
North Dakota	+ 0.80	119	North Pacific	— 0.80	97
Upper Mississippi Valley	+ 4.10	147	Middle Pacific	— 1.10	93
Missouri Valley	+ 3.50	148			
Northern Slope	+ 0.40	111			
Middle Slope	+ 1.90	136			
Abilene (southern Slope)	+ 0.50	115			
Southern Plateau	+ 1.50	176			
Middle Plateau	+ 0.90	116			
Northern Plateau	+ 0.20	103			
South Pacific	+ 1.20	116			
South Atlantic	+ 0.00	100			

MOISTURE.

The *quantity of moisture* in the atmosphere at any time may be expressed by the weight of the vapor coexisting with the air contained in a cubic foot of space, or by the tension or pressure of the vapor, or by the temperature of the dew-point. The mean dew-point for each station of the Weather Bureau, as deduced from observations made at 8 a. m. and 8 p. m., daily, is given in Table I.

The *rate of evaporation* from a special surface of water on muslin at any moment determines the temperature of the wet-bulb thermometer. The mean wet-bulb temperature is now published in Table I; it is always intermediate, and generally about half way between the temperature of the air